

# **Resource Document**

## **Summer Safety Campaign**

### ***Electrical Safety/Injury Prevention***

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#### **Narrative:**

People are injured when they become part of the electrical circuit. Humans are more conductive than the earth (the ground we stand on) which means if there is no other easy path, electricity will try to flow through our bodies.

There are four main types of injuries: electrocution (fatal), electric shock, burns, and falls. These injuries can happen in various ways:

- Direct contact with the electrical energy. When electricity travels through our bodies, it can interfere with the normal electrical signals between the brain and our muscles (e.g., heart may stop beating properly, breathing may stop, or muscles may spasm).
- When the electricity arcs (jumps, or "arcs") through a gas (such as air) to a person who is grounded (that would provide an alternative route to the ground for the electricity).
  - Arc flashes result in intense heat (causing burns), intense light (can cause blindness), or ignition of other materials.
  - Arc blasts cause the same conditions as an arc flash, but are more intense and can also include a strong pressure wave. These pressure waves can damage machinery, throw a person, collapse a lung or rupture ear drums.
- Thermal burns including flash burns from heat generated by an electric arc, and flame burns from materials that catch on fire from heating or ignition by electrical currents. High voltage contact burns can burn internal tissues while leaving only very small injuries on the outside of the skin.
- Muscle contractions, or a startle reaction, can cause a person to fall from a ladder, scaffold or aerial bucket. The fall can cause serious injuries.

#### **Key Messages:**

While electrical hazards threaten all members of the Army, we must consider the families which are the youngest and oldest, who are the most vulnerable. Nearly seven children a day are treated in emergency rooms for electric shock or burns caused by tampering with a wall outlet and one-third of people who are killed by home electrical fires are over the age of 65. With that in mind, the Army is asking their folks to use the safety materials developed by the ESFI, which targets the most at-risk population with updated resources.

"Following basic safety precautions is the key to preventing many electrocutions and home electrical fires," says ESFI President Brett Brenner. "This year's campaign

features a collection of easily sharable safety resources that are specifically tailored to older adults, children, and everyone in between to ensure that our messages resonate with the largest audience possible.”

Electrical safety awareness and education among our Army family which includes civilians, contractors and all their family members will prevent electrical fires, injuries and fatalities.

### **Talking Points:**

- If a fuse blows or a circuit breaker trips often, find out why and correct the problem. Replace fuses with the correct amp rating for the circuit they protect; never replace a fuse with a higher rated fuse. If the problem continues, call an electrician.
- Only plug one heat-producing appliance (such as a coffeemaker, toaster, space heater, etc.) into a receptacle outlet at a time.
- Buy only appliances that have the label of a recognized testing laboratory.
- Replace cracked and damaged electrical cords.
- Pinching cords against walls or furniture or running them under carpets or across doorways can cause a fire.
- Use extension cords for temporary wiring only.
- Follow the manufacturer’s instructions for plugging an appliance into a receptacle outlet.
- Avoid overloading outlets. Plug only one high-wattage appliance into each receptacle outlet at a time.
- Consider having additional circuits or receptacles added by a qualified electrician.
- If an appliance is malfunctioning, unplug it if it is safe to do so.
- Arc-fault circuit interrupters (AFCIs) are a new kind of circuit breaker that shut off electricity when a dangerous condition occurs. Consider having them installed in your home. Use a qualified electrician.
- Ground-fault circuit interrupters (GFCIs) reduce the risk of shock. GFCIs shut off an electrical circuit when it becomes a shock hazard.
- Test AFCIs and GFCIs once a month to make sure they are working properly.
- Tamper-resistant receptacles have spring-loaded shutters that close off the slots of the receptacle. These receptacles are important in making a home a safe place for children.
- Keep ladders away from overhead power lines including the electrical service into your home.
- Never touch a power line. Stay at a safe distance — you could be electrocuted.
- Report downed power lines to authorities.
- Some power lines are underground. Call your local authority regarding digging.

### **Tips:**

- Inspect tools, power cords, and electrical fittings for damage or wear prior to each use. Repair or replace damaged equipment immediately.
- Always tape cords to walls or floors when necessary. Nails and staples can damage cords causing fire and shock hazards.
- Use cords or equipment that is rated for the level of amperage or wattage that you are using.

- Always use the correct size fuse. Replacing a fuse with one of a larger size can cause excessive currents in the wiring and possibly start a fire.
- Be aware that unusually warm or hot outlets may be a sign that unsafe wiring conditions exists. Unplug any cords to these outlets and do not use until a qualified electrician has checked the wiring.
- Always use ladders made of wood or other non-conductive materials when working with or near electricity or power lines.
- Place halogen lights away from combustible materials such as cloths or curtains. Halogen lamps can become very hot and may be a fire hazard.
- Risk of electric shock is greater in areas that are wet or damp. Install Ground Fault Circuit Interrupters (GFCIs) as they will interrupt the electrical circuit before a current sufficient to cause death or serious injury occurs.
- Make sure that exposed receptacle boxes are made of non-conductive materials.
- Know where the breakers and boxes are located in case of an emergency.
- Label all circuit breakers and fuse boxes clearly. Each switch should be positively identified as to which outlet or appliance it is for.
- Do not use outlets or cords that have exposed wiring.
- Do not use power tools with the guards removed.
- Do not block access to circuit breakers or fuse boxes.
- Do not touch a person or electrical apparatus in the event of an electrical accident. Always disconnect the current first.

#### **What are some tips for working with power tools?**

- Switch tools OFF before connecting them to a power supply.
- Disconnect power supply before making adjustments.
- Ensure tools are properly grounded or double-insulated. The grounded tool must have an approved 3-wire cord with a 3-prong plug. This plug should be plugged in a properly grounded 3-pole outlet.
- Test all tools for effective grounding with a continuity tester or a ground fault circuit interrupter (GFCI) before use.
- Do not bypass the switch and operate the tools by connecting and disconnecting the power cord.
- Do not use electrical tools in wet conditions or damp locations unless tool is connected to a GFCI.
- Do not clean tools with flammable or toxic solvents.
- Do not operate tools in an area containing explosive vapours or gases, unless they are intrinsically safe and only if you follow the manufacturer's guidelines.

#### **What are some tips for working with power cords?**

- Keep power cords clear of tools during use.
- Suspend power cords over aisles or work areas to eliminate stumbling or tripping hazards.
- Replace open front plugs with dead front plugs. Dead front plugs are sealed and present less danger of shock or short circuit.
- Do not use light duty power cords.
- Do not carry electrical tools by the power cord.
- Do not tie power cords in tight knots. Knots can cause short circuits and shocks. Loop the cords or use a twist lock plug.

## **Statistics**

In the United States, home electrical failures or malfunctions cause more than 50,000 fires each year, resulting in 450 deaths, nearly 1,500 injuries, and over \$1.5 billion in property damage, according to the National Fire Protection Association (NFPA). To help prevent electrical fires and incidents, it is vital that consumers know the ins and outs of their electrical system and understand the safety concerns associated with the latest residential technologies before bringing them into their homes.

There were a total of 19 accidents (A, B, C, and D) that resulted in injuries from exposure to electricity. In FY2010 there were two fatalities, 1 Soldier and 1 Civilian, these were the only fatalities in the past three years; in FY2010 and FY2011 there were seven accidents and in FY2012 there were five. The majority of accidents were class C. In addition to the two fatalities, there was one Class B in FY2011 and four Class D in the last three fiscal years.